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# Conservation Pledge

**I give my pledge as an American to save and faithfully to defend from waste the natural resources of my country—its soil and minerals, its forests, waters and wildlife**

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*Small game surveys conducted by the state show that the number of rabbit hunters in the State have increased more than 100 per cent during the past 13 years. Interest in beagles has also increased at a similar rate and there are a number of beagle clubs throughout the State. Cover photograph shows a successful hunter holding a cottontail while beagles leap and bark.*

(Photograph by Robert Dennie)

LOUISIANA
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IN BRACKISH WATER

# Fish Culture Studies in Louisiana

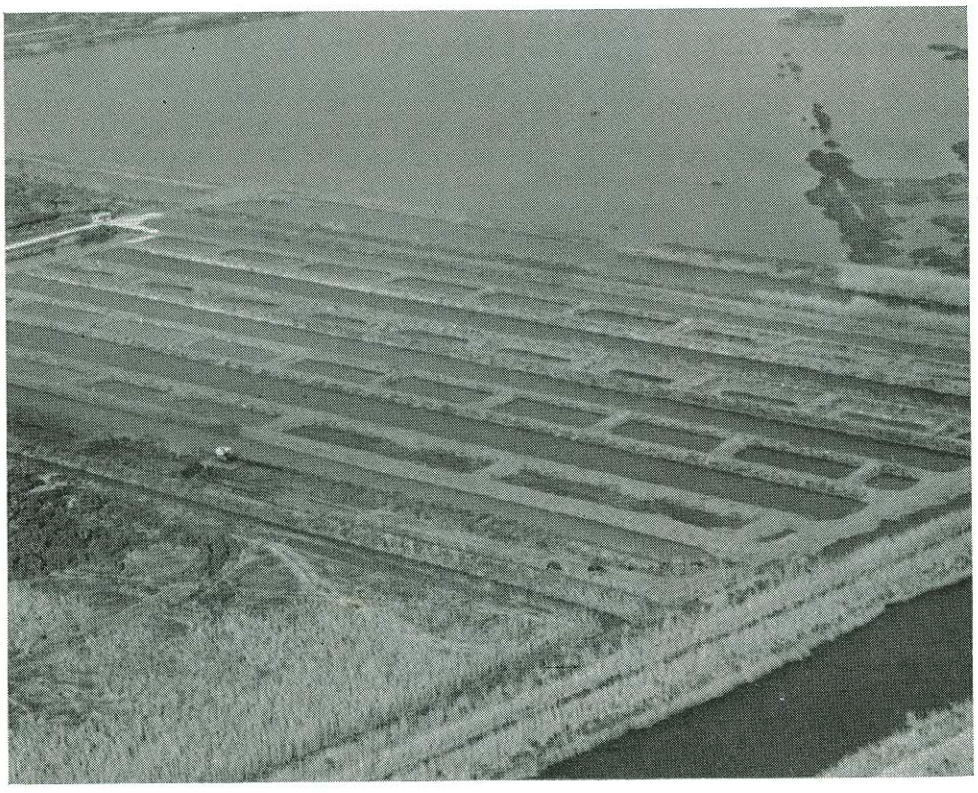
**W. Guthrie Perry, Jr.**

FISH CULTURE IN PONDS is an old profession. The Japanese are reported to have raised oysters as early as 2000 B.C. and the Romans about 100 years B.C. Records recovered from a tomb in Egypt indicated that fish were also taken from artificial ponds some time before 2000 B.C. Fish fry collections and transport in China date from 1639 B.C. Although fish farming is an old occupation it has advanced little over the years. Development has possibly been retarded by a lack of biological knowledge and because other inexpensive and abundant sources of fish and land-grown food have been available to feed the growing human population.

Practically all of the present knowledge about the cultivation of salt-water fishes has been derived from the fish farming operations in Europe and the Far East. Prompted by food shortages, these people were forced to seek new methods of food production. Now they are producing tremendous poundages of seafood in brackish waters, otherwise useless for fruit, grain or vegetables. India is producing up to 406 pounds of milk fish per acre in man-made ponds. Also, along the western coast of North Adriatic, numerous fish species are produced in salt-water ponds. Although the United States is not protein-deficient, we must look to the future.

All predictions of future population trends forecast rapid increases. In the United States alone the population is expected to be about 250 million people by 1975. With the greater populations there will be a greater demand for food, including seafood. In lower income countries the diet is limited, but as the economy increases the people will eat wider varieties of foods, thus encouraging consumption of seafoods. The 1965 figure for fish consumption of about 4.5 kilograms (10 pounds) per capita in the United States is expected to double by 1970. At present, it is reported that we are importing 3,750,000 tons of fish annually.

In 1966 the Refuge Division of the Louisiana Wild Life and Fisheries Commission began work on a research station for brackish water research relating to the ecology and culture of various estuarine species. A total of 51 ponds have been constructed on Rockefeller Wildlife Refuge in Grand Chenier, Louisiana. These ponds range in size from 0.1 acres to 5 acres. Ponds are currently being used for catfish, pompano and crawfish projects. We have found that pond construction in the marshes to be unlike any others. Here to begin with, the dirt has to be moved with a floating dragline or one on mats, as much of the soil is in a semi-fluid state and will not support a dragline. After the levees have been built they have to settle and dry for several months. Often shrinkage is as much as 60 percent. Some of our levees



**Newly constructed ponds ranging in size from one-tenth acre to one-third acre are currently being used for catfish and pompano projects.**

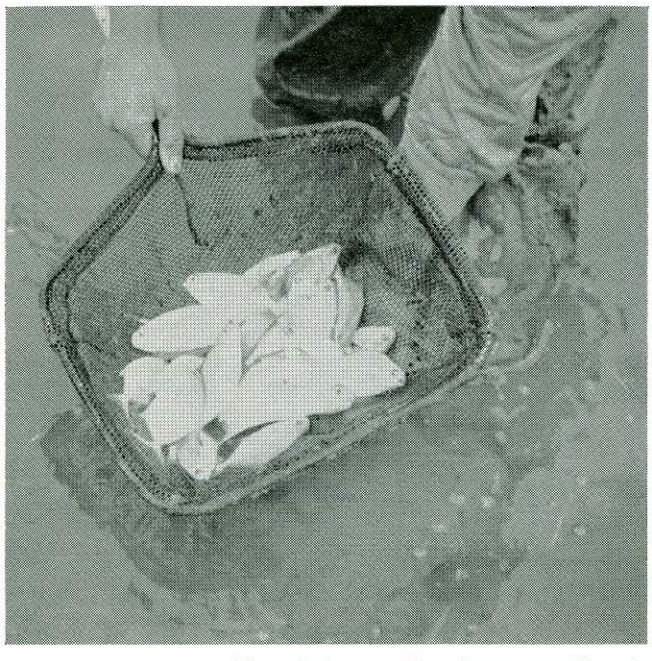
after two years of use have only a dried crust of 6 to 8 inches. The ponds are constructed in such a manner as to allow water collection from a saline bayou leading to the Gulf of Mexico or from a canal draining the freshwater marsh.

The Refuge Division is one of the cooperators in the Cooperative Fishery Unit in the School of Forestry and Wildlife Management at Louisiana State University. Participation by the Division has not only been financial but active assistance has been given to faculty and students. Several projects are conducted by Louisiana State University faculty and personnel of the Division.

## ATLANTIC CROAKER

The initial fishery experiment conducted on Rockefeller Wildlife Refuge was a pilot study involving Atlantic croakers. The croakers were obtained in a natural canal system near the Gulf of Mexico and placed in one-third acre brackish water ponds. Eight months later the ponds were drained and growth data recorded. The croakers were approximately two to three inches long when stocked and seven to eight inches when harvested. Also, it was noted that most of the fish had advanced or ripe gonads when harvested.

We believe that croakers may be successfully cultured in brackish ponds in Louisiana. However, initial attention should be devoted to other species that are in greater demand.



**Pompano are considered for pond culture studies in Louisiana. Pictured are fish grown in 0.1 acre experimental ponds at Rockefeller Wildlife Refuge.**

## POMPANO

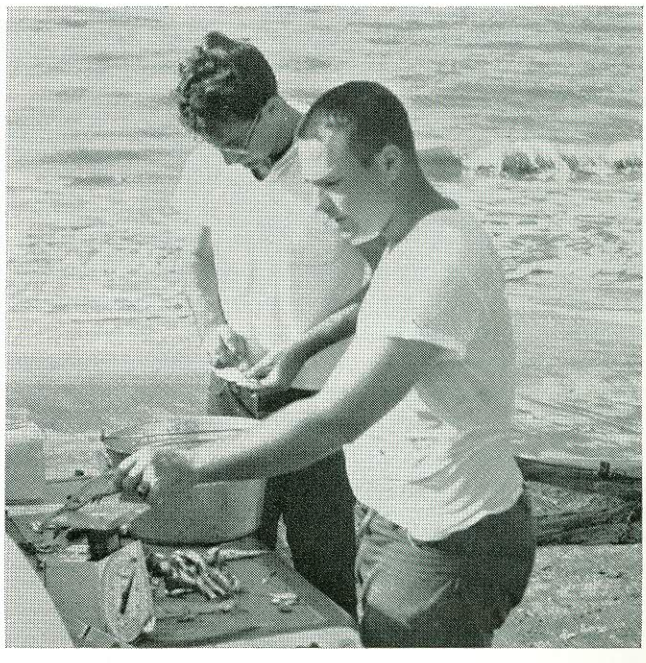
Pompano, one of Louisiana's valued delicacies, were considered for pond culture studies on Rockefeller Wildlife Refuge. The supply of pompano is limited seasonally, and the cost of obtaining them is high. The raising of pompano successfully in ponds could result in a year-round supply and a new fishery industry for the state.

Pompano are known to live on small benthic organisms, crustaceans including crab larvae, diptera, mollusks, invertebrates eggs, small fish and scraps. Growth is estimated to be from 1 to 10 inches a year and weight of one pound obtained. In its natural environment this fish may reach weights of 6 to 7 pounds. One was recently caught by a Louisiana fisherman weighing 6.3 pounds (state record).

Pompano spawn offshore from February to September. April and May seem to be the peak months. Juveniles have been collected along the state's shores through November depending upon water temperatures.

Last year pompano were collected from Grand Isle, and transported by specially-equipped trucks to Rockefeller Wildlife Refuge. These fish were then stocked in ten one-tenth acre ponds.

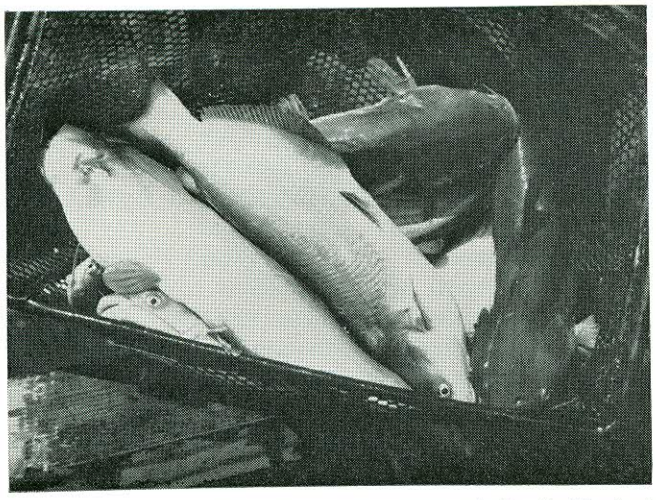
This was the first attempt at pompano culture in Louisiana. The preliminary results of this experiment indicated that satisfactory growth is possible in Louisiana's coastal ponds. But additional research is necessary before any recommendations can be made concerning successful pompano culture.



**Biologists weighing and measuring specimens obtained by beach seining. Much time has been devoted to the study of migrating patterns and taxonomy of fishes.**

## CATFISH

The rapid increase in fish farmers in Louisiana is a good indication that catfish are most desirable to grow as food fish. Numerous experiments have been conducted on feeding, reproductive needs, parasites, transport and harvest of freshwater catfish. However, only a few studies have been conducted involving the ecology of the species, and among these are only limited accounts of their collection in brackish habitats. Samples collected from our Pass-a-Loutre Waterfowl Management Area located at the mouth of the Mississippi River revealed monstrous blue catfish present. This is a brackish water area (area in which both sea



**Preliminary results of a one year study indicated that channel catfish outgrew both white and blue catfish.**

water and fresh water are mixed with a salinity of less than 30 parts per thousand). And, after talking to several catfish farmers located on areas that possessed only brackish water, it was decided to evaluate the production of the three most accepted catfish species for pond culture and determine which if any could be reared in these saline waters.

The three species selected were blue catfish, channel catfish, and white catfish. The white catfish is not native to our state, but is found in coastal areas of other states and possess qualities resembling the blue and channel catfish. All were collected from freshwater hatcheries and placed in the brackish water ponds with an equal amount amount of acclimatization.

The results of the catfish experiment proved very promising. The production of freshwater catfish in brackish water ponds, on an experimental basis, had not been tried before. In the past, fish culturists felt that channel catfish could not be grown in waters with a salinity of over 1.5 parts per thousand (thirty-five ppt is full sea strength). In the Rockefeller ponds the salinity ranged from 3 ppt to 10 ppt all season. Growth was good among all species. The channel and white grew best, averaging 1.25 to 1.03 pounds apiece. The blues averaged 0.63 pounds each. In freshwater, blues are known to grow slower the first year, but outgrow the channel and white the second growing season.

**Ponds must be seined in order to adjust feeding rates. Fish are fed amounts based upon per cent body weight.**

Some of the fish were eaten after the cessation of the experiment since it was feared that they would possess a marshy taste. The taste of all fishes was rated excellent and none had a muddy taste or offensive odor.

Experiments are now being conducted with brood catfish to determine the effects of salinity upon reproduction. Data collected thus far is too scanty at present to give any results or predictions of results.

### CRAWFISH

Of the 29 species of crawfish found in Louisiana, two are highly valued as a food source. The red swamp crawfish and the white river crawfish have been cultured in Louisiana for over two decades.

Thus far, very little is known as to the effect of salinity upon crawfish production. The Louisiana marshes may offer a vast potential for future crawfish farmers. However, the southernmost boundary of the marshes contain varying amounts of salt water depending upon nearness to the Gulf of Mexico. Field experiments have begun at Rockefeller in order to better evaluate laboratory bioassey data already obtained by Commission biologist.

Not all of our fisheries work at Rockefeller has been centered around pond culture. Much time has been devoted to the study of the migrating patterns and taxonomy of fishes of the area. A good representation of the fish of the area have been prepared and placed on display at Rockefeller headquarters. Food habit and age and growth studies are being conducted on several estuarine species.

In summary, brackish-water aquaculture in this country is still in its infancy. However, other countries have successfully produced food fishes in brackish waters. Louisiana with its vast coastal marsh land could possibly possess a great potential in the United States in brackish water fish culture. This can only be acquired through the much needed brackish water fisheries research. ✠

## Wildlife Shorts

Although several species of Louisiana sea fish are called "Blackfish", the Triple tail is a good sports fish and probably the best known. Fishermen ascribe to the Blackfish an add habit of "sunning itself" on its side on the surface of the water.

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One of the most beautiful of all fishes, the Spanish Mackerel, is a familiar species of the Gulf of Mexico. Its burnished sides show a luster, flecked with gold, like the pearly lining of sea shells.